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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/781,437

02/17/2004

Kyung-Joo Suh

678-1357

3443

66547 7590 12/06/2007

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EXAMINER

PHAN, MAN U

ART UNIT

PAPER NUMBER

2619

MAIL DATE

DELIVERY MODE

12/06/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/781,437

Applicant(s)

SUH ET AL.

Examiner

Man Phan

Art Unit

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 24-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-8,10-15,20 and 22 is/are rejected.
- 7) ☒ Claim(s) 3,4,9,21 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The application of Suh et al. for a "Method for calculating hop count of mobile IP in an IP network" filed 02/17/2004 has been examined. . This application claims foreign priority based on the application P2003-9734 filed February 17, 2003 in Republic of Korea. Receipt is acknowledged of papers submitted under 35 U.S.C 119(a) – (d), which papers have been placed of record in the file. Responsive to the restriction requirement filed on 09/20/2007, affirmation of the election has been made by applicant, and a provisional election was made without traverse to prosecute the invention of group I, claims 1-23. Claims 24-26 are withdrawn from further consideration by the Examiner, 37 C.F.R. ' 1.142(b), as being drawn to a non-elected invention. Claims 1-23 are pending in the application.

2. The applicant should use this period for response to thoroughly and very closely proof read and review the whole of the application for correct correlation between reference numerals in the textual portion of the Specification and Drawings along with any minor spelling errors, general typographical errors, accuracy, assurance of proper use for Trademarks <sup>TM</sup>, and other legal symbols @, where required, and clarity of meaning in the Specification, Drawings, and specifically the claims (i.e., provide proper antecedent basis for "the" and "said" within each claim). Minor typographical errors could render a Patent unenforceable and so the applicant is strongly encouraged to aid in this endeavor.

***Claim objections***

3. Claims 14 and 15 are objected to because of the following informalities: claims 14 are the same as 15 in term of method claims, these claims are now in duplicate.

Applicant is advised that these claims are objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP 706.03(k). Appropriate correction is required.

4. Claims 1, 7, 13, 20, 22 are objected to because of the following informalities: The claims contain the phrase "capable of". It has been held that the recitation that an element is "capable of" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 1-2, 5-8, 10-15, 17-20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over El-Malki et al. (US#6,947,401) in view of Funabiki et al. (US#2005/0020265).

1. With respect to claims 1, 7, 13, 20 and 22, the references disclose a novel system and method for mobile communication supported with IPv6 in order for communications with another communication node, according to the essential features of the claims. El-Malki disclose in Fig. 3 a block diagram illustrated a network which uses a mobility anchor point (MAP) for supporting mobility of a mobile node in a network system including a home agent for managing an address of the mobile node and a plurality of access routers. The method comprising the steps of: acquiring by the mobile node a care-of address (CoA) from a first access router when the mobile node is located in the first access router (column 4 line 61 to column 5 line 47); determining by the mobile node whether the first access router provides a regional anchor point (RAP) function; and transmitting a CoA assigned from a second access router to the first access router by the mobile node that has moved from the first access router to the second access router, when the first access router has a RAP function (column 5 lines 21-47). El-Malki discloses an

exemplary method for generating and processing router advertisements, in which determining whether the second access router is located within a predetermined distance from the first access router (Figure 4, column 5 line 48 to column 6 line 67). El-Malki further teaches three phases to the present invention, mobility anchor point discovery, binding updates and packet routing. The mobility anchor point discovery phase generally consists of providing indications, to mobile nodes, of the mobility anchor points which are accessible through a particular access router. Once a mobile node selects a particular mobility anchor point for its alternate-care-of-address, which is also referred to as the regional care-of-address (RCOA), the mobile node registers with the mobility anchor point using binding updates. This binding update communicates the mobile node's current location (i.e. the address obtained from the access router that is attached to, which is also referred to as the on-link care-of-address (LCOA)) and requests a binding between it and the mobile node's home address. After registering with the mobility anchor point the mobile node will then send binding updates to its home agent and to any correspondent nodes with which the mobile node is currently communicating with. These binding updates will bind the mobile node's home address to the RCOA, i.e., the mobility anchor point address. Hence the binding caches of all correspondent nodes and the home agent will include the mobility anchor point address as a care of address for the mobile node. Once the binding updates have been performed, packets are routed to the mobile node via the alternate care-of-address which corresponds to the mobility anchor point with which the mobile node had registered, i.e., the RCOA (See also Fig. 9 and Col. 5, lines 21 plus).

In the same field of endeavor, Funabiki et al. (US#2005/0020265) teaches a method and apparatus for mobile communications supported with IP version 6 (hereinafter referred to as

"IPv6") in order for communications with another communication node through the use of the same address while the mobile node is connected with the other than the home link including a measuring section for measuring at least any one of a hop number and communication delay time to a home agent; a home agent information acquiring section for acquiring information about a home agent as a subject of measurement of the measuring section; and a home agent selecting section for changing, when a measurement value to the home agent to which the mobile node belongs becomes equal to or greater than a first predetermined value, the belonging home agent into the new home agent by using the information which acquired in the acquiring section, having a measurement value equal to or less than a second predetermined value ([0009]-[0012]).

It's noted that, the hop limit field defines a maximum path number of a hop, which is of an unsigned integer type. The hop limit field decrements by one by means of each node each time the packet is forwarded. The packet is ignored when the hop limit field value becomes "0." (see, for example, RFC 2460 Internet Protocol, Version 6 (IPv6) Specification). The Hop Limit field in the IP header, which is specified by IPv6 is composed of an 8-bit unsigned integer, and decrements by 1 each time an IP packet is transferred at a node. An IP packet whose Hop Limit value has expired is discarded at this node. (The Hop Limit field for IPv6 has substantially the same function as that of the TTL field for IPv4. While the Hop Limit field for IPv6 can only designate the maximum number of hops through which a packet to be transferred between nodes can pass, and does not designate time, the TTL field for IPv4 can designate not only the number of hops but also the number of seconds.

Regarding claims 2, 8, 14, 15, Funabiki further teaches in Figs. 1 and 11 the flow charts for explanation on the home agent operation when a mobile node 10 requests a registration to the

home agent. The network interface 1300, when receiving a binding update message 3950 from a mobile node 10 (step S1601), makes a notification to the hop-number measuring section 1305 and communication delay time measuring section 1307. Incidentally, Step S1601 corresponds to Step S301 and S303 of Fig. 1. Next, the hop-number measuring section 1305 measures a hop number of the received message (step S1602), while the communication delay time measuring section 1307 measure a communication delay time (step S1603). The hop-number measuring section 1305 makes reference to a field (hop limit field 3901) representing a hop number in an IP header of the received binding update message 3950 and determines a difference from an initial value set in the mobile node 10, thereby determining a hop number. The initial value of hop limit field 3901 is set to a value common among all the binding update messages 3950. Otherwise, an initial hop limit option 3930 representative of an initial value is added into the binding update message 3950 as showing in FIG. 25. The mobile node 10 sets the same value as the initial value set in the hop limit field 3901, and the hop-number measuring section 1305 makes reference to that field. Otherwise, measurement is possible by the use of a traceroute command. The communication delay time measuring section 1307 sends an ICMP echo request message to the mobile node 10. The communication delay time measuring section 1307, after receiving the ICMP echo request message from the mobile node 10, measures a time of from transmitting the ICMP echo request message to receiving the ICMP echo reply message. Then, the home agent information notifying section 1304 determines whether the hop number or communication delay time is greater than a threshold, or computes a determination value A according to Equation (1) on the basis of the value measured by the hop-number measuring section 1305 and communication delay time measuring section 1307 and compares it with a predetermined



threshold (step S1604)(Fig. 25, [0166]-[0171]).

With respect to claims 5-6, 10-12, 17-19, Funabiki further teaches the measuring section of a mobile node of the invention determines the hop number by computing a difference between an initial value of a hop limit field in a header of a packet of IP version 6 sent from the home agent and a value of the hop limit field received (Fig. 1, [0013] and [0105] plus).

One skilled in the art would have recognized the need for effectively and efficiently routing traffic data in an IP network, and would have applied Funabiki's teaching of the measuring hop count number in mobile communication system supported IPv6 into El-Malki's novel use of the mobility management function for routing packets to mobile node. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to apply Funabiki's mobile node, router, server and method for mobile communications under IPv6 protocol into El-Malki's hierarchical mobility management for wireless networks with the motivation being to provide a method and system for calculating hop count of mobile IP in an IP network.

***Allowable Subject Matter***

8. Claims 3, 9, 16, 21, 23 are objected to as being dependent upon a rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein the step of generating by the MN a binding update message and sending to a correspondent node and a

home agent the generated binding update message, if it is determined from the hop count that a distance between the new access router and the RAP exceeds a distance limitation, as specifically recited in the claims.

### *Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Suh et al. (US#2004/0105408) is cited to show the system and method for supporting mobility of mobile node using regional anchor point in future internet.

The Park et al. (US#6,556,543) is cited to show the method for determining maximum hop count in bus having tree structure.

The Katsubea et al. (US#6,501,756) is cited to show method of managing hop count in label switching network and node apparatus.

The Katsubea et al. (US#6,608,833) is cited to show method of managing hop count in label switching network and node apparatus.

The Katsubea et al. (US#6,606,318) is cited to show method of managing hop count in label switching network and node apparatus.

The Grimminger (US#2004/0039831) is cited to show a method and arrangement for router advertisement in a network with mobile anchor points.

The Watanuki et al. (US#2002/0159478) is cited to show mobile node, mobile agent and network system.

The Nakatsugawa et al. (US#2002/0186679) is cited to show a mobile node supporting router.

The Joshi (US#2004/0143842) is cited to show a system and method for achieving continuous connectivity to an access point or gateway in a wireless network following an on-demand routing protocol, and to perform smooth handoff of mobile terminals between fixed terminals in the network.

The Ebata (US#2003/0174652) is cited to show a multi hop network for transmission of packets whose size is determined by hop count number.

The Rochberger et al. (US#6,147,971) is cited to show a optimized routing method based on minimal hop count for use in PNNI based ATM networks.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Man U. Phan whose telephone number is (571) 272-3149. The examiner can normally be reached Monday through Friday from 6:00 am to 3:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel, can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

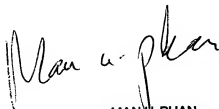
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-2600.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at toll free 1-866-217-9197.

MPhan

12/05/2007

A handwritten signature in black ink, appearing to read "Man U. Phan". The signature is fluid and cursive, with the first name "Man" and last name "Phan" clearly distinguishable, and a middle initial "U." in between.

MAN U. PHAN  
PRIMARY EXAMINER